

The opinion in support of the decision being entered today was **not** written for publication and is **not** binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte PHILLIP D. COOK, PEI-PEI KUNG, and ANDREW M. KAWASAKI

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Appeal No. 2002-0795  
Application No. 09/128,036

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ON BRIEF

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Before WALTZ, TIMM, and MOORE, Administrative Patent Judges.  
WALTZ, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on an appeal from the primary examiner's final rejection of claims 1 through 8, which are the only claims pending in this application.<sup>1</sup> We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to a method of preparing a library of chemical compounds by providing

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<sup>1</sup>An amendment dated Dec. 8, 2000, Paper No 12, subsequent to the final rejection, was entered by the examiner as noted in the Advisory Action dated Jan. 5, 2001, Paper No. 13.

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a scaffold compound that comprises at least one reactive functionality, contacting the scaffold compound with a mixture that comprises at least four appendage moieties to form covalent bonds with the reactive functionalities on the scaffold to form an intermediate library, and reacting the intermediate library compounds with a reducing agent to reduce the covalently bound appendage moieties, thereby forming the desired library of chemical compounds (Brief, pages 2-3).

Illustrative independent claim 1 is reproduced below:

1. A method of preparing a library of chemical compounds comprising:

providing a scaffold comprising at least one reactive functionality thereon; contacting said scaffold with a mixture comprising at least four appendage moieties to form covalent bonds between said at least four appendage moieties and said at least one reactive functionality, thereby forming an intermediate library; and contacting said intermediate library with a reducing agent under conditions effective to reduce said covalently bound appendage moieties, thereby forming said library of chemical compounds.

The examiner relies upon the following references as evidence of obviousness:

Cody et al. (Cody)	5,324,483	Jun. 28, 1994
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Smith et al. (Smith), "Synthesis and Biological Evaluation of a Library containing potentially 1600 Amides/Esters. A Strategy for Rapid Compound Generation and Screening," 2821-2824 *Bioorganic & Medicinal Chemistry Letters*, Vol. 4, No. 24, Dec. 22, 1994.

The claims on appeal stand rejected under 35 U.S.C. § 103(a) as unpatentable over Cody in view of Smith (Answer, page 3).<sup>2</sup> We reverse this rejection essentially for the reasons stated in the Brief, Reply Brief, and those reasons set forth below.

#### OPINION

The examiner finds that Cody discloses methods of making a variety of combinatorial libraries by methods of parallel synthesis, including the reaction of scaffold compounds with reactive functionalities and appendages with at least four different moieties to form an intermediate library, followed by a reduction to form the final library of compounds (Answer, page 4). The examiner recognizes that Cody lacks any disclosure or teaching of using a mixture of reactants to react with the scaffold compound and form the intermediate library (*id.*).

The examiner states that it was "well known in the art" to carry out combinatorial syntheses using mixtures of reagents, citing Smith as evidence of a teaching that synthesis of chemical libraries may be accomplished by using a mixture of reactants (i.e., nucleophiles and acid chlorides). *Id.* From these

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<sup>2</sup>The final rejection of claim 1 under the second paragraph of 35 U.S.C. § 112 has been withdrawn in view of the amendment subsequent to the final rejection (see the amendment dated Dec. 8, 2000, Paper No. 12, and the Advisory Action dated Jan. 5, 2001, Paper No. 13).

findings, the examiner concludes that it would have been *prima facie* obvious to one of ordinary skill in the art to make a library of compounds as disclosed by Cody, modified by the teaching of Smith concerning the use of mixtures of reagents (*id.*). The examiner states that the motivation for making the proposed modification is the teaching in Smith that the use of mixtures of reactants "can provide simplicity to the reactions and workup (see page 2822, top)." *Id.* We disagree.

When determining the patentability of a claimed invention which comprises two known elements, it is incumbent upon the examiner to present evidence that there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. See *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). "[A] reference that teaches away is a significant factor to be considered in determining unobviousness." *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). In this rejection on appeal, we determine that the examiner has not presented convincing evidence of a motivation, reason or suggestion to combine the

references as proposed, especially in view of the teaching away from the claimed subject matter in the Cody reference.

As correctly argued by appellants (Brief, pages 3-4; Reply Brief, pages 2-3), and admitted by the examiner (Answer, page 7), Cody specifically teaches that the "final compounds should be produced individually (*not as mixtures*) in soluble form." Col. 2, ll. 47-49, italics added. Contrary to the examiner's assertion that this teaching of Cody is "a feature of the apparatus, having nothing to do with the libraries made" (Answer, page 7), we determine that this teaching of Cody is reiterated throughout the disclosure of this reference as directly related to the final libraries. Cody specifically teaches that the method of making libraries includes "multiple, simultaneous synthesis" of compounds (col. 2, ll. 29-30), involving an array format to generate multiple compounds simultaneously (col. 3, ll. 18-20). Cody discloses that the final compound is formed at each location in the array (col. 3, ll. 29-32), yielding a subset of related, individual compounds (col. 4, ll. 54-57). Cody further teaches that the number of reaction tubes equal the total number of compounds to be synthesized (col. 13, ll. 4-9), with the final compounds "individually tested for biological activity once they are isolated" (col. 14, ll. 50-51). Accordingly, using mixtures

of reagents/reactants in the apparatus and method of Cody would have frustrated the purpose and testing procedure taught by this reference. See *In re Gurley, supra*.

The examiner states that the motivation for modifying Cody with the mixtures of reactants of Smith is that Smith teaches that "use of mixtures can provide simplicity to the reactions and workup (see page 2822, top)." Answer, page 4 (see also pages 6 and 8). However, the only teaching found on page 2822 (top) of Smith is that "[t]he synthesis utilises a very simple chemical coupling protocol and does not generate any biproducts which could interfere with biological assays." The examiner has not explained why the chemical coupling protocol of Smith is simpler than the chemical coupling disclosed by Cody or why the "workup" of Smith, directed to a mixture of many similar products, would have been easier or simpler than the "workup" of Cody, which is directed to the preparation of only one compound per reaction tube. Therefore we determine that the motivation proposed by the examiner is not sufficiently supported by the evidence of record.

The examiner's alternate motivations to combine the references, i.e., "structural similarity," and "design choice or optimization" (Answer, page 6), are also not supported by any convincing evidence on this record. The examiner has failed to

explain why the structural similarity of the compounds produced by Cody and Smith would have motivated one of ordinary skill in this art to modify the reactants and method used in obtaining the products, especially in view of the teaching away from mixtures found in Cody.

Finally, the examiner states another alternate motivation to combine the references, i.e., Smith teaches use of mixtures of reactants "to be able to screen a large number of diverse compounds in a short timespan" (Answer, page 8). However, the examiner has not explained or presented evidence why one of ordinary skill in this art would have modified the method of Cody in view of this teaching of Smith since Cody also teaches screening a large number of compounds in a short timespan (the time of the simultaneous reactions).

For the foregoing reasons and those stated in the Brief and Reply Brief, we determine that the examiner has not established any motivation to combine the references as proposed and therefore we determine that no *prima facie* case of obviousness has been presented. Accordingly, the rejection of the claims on appeal under 35 U.S.C. § 103(a) over Cody in view of Smith is reversed.

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The decision of the examiner is reversed.

**REVERSED**

Thomas A. Waltz	)	
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
Catherine Timm	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
	)	
	)	
James T. Moore	)	
Administrative Patent Judge	)	

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